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ing each bundle; the absence of lacunes in the hadrome; and the irregular arrangement of the vessels.

In contrast to *Equisetum Telmateja*, mentioned above, the tubers of *E. sylvaticum* are ovoid and arranged so as to form a rosary; but the structure agrees very well with that of the preceding species, except that some layers of the bark-parenchyma are strongly thickened so as to form a kind of protecting sheath around the central part of the tuber, which peculiarity is, also, to be observed in the rhizome of this species.—THEO. HOLM.

Yeast fungi.

Professor Emil Christian Hansen upholds[2] the correctness of statements concerning endogenous spore-formation in the cells of Saccharomyces, against the opposition of Moeller, to whose paper the February GAZETTE called attention. Hansen gives a short review of spore-formation in this division of fungi, the conclusion of which is that the spores possess a membrane and germinating power. Very likely Moeller has confounded oil-drops and similar formations often found in old cells, with the true spores. It is incomprehensible that anybody can doubt the formation of endogenous spores in Saccharomyces. But of course we have to follow strictly the rules given by Hansen.[3]

Prof. Groenlund[4] has established four new yeast fungi, namely, *Saccharomyces Ilicis I* and *II* (both found on *Ilex*), *S. Aquifolii*, and *Torula Novæ-Carlsbergiæ*. The three Saccharomyces are found producing spores and the new species are based upon the relation of this phenomenon to temperature. The Torula gives beer a very unpleasant and bitter taste.—J. CHRISTIAN BAY.

Soluble pentoses in plants.

De Chalmot[5] gives in his studies on the pentoses in the plants a very important contribution to the chemistry of assimilation. The so-called "pentosanes" of Tollens[6] are widely distributed in the plants. These give pentoses by hydrolysis, and two sugars, arabinose and xylose, have been obtained from them. The theory of assimilation, given by Baeyer, which assumes that formic aldehyde, being the first product of assimilation, is the origin of the carbohydrates, has been supported by the fact established by Bokorny[7], that sodium-oxymethylsulphonic acid could supply the amount of carbon wanted by Spirogyra.

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[2] Centralbl. f. Bakteriol. und Parasitenkunde, XIII, (1893) 16.

[3] Meddelelser fra Carlsberg Laboratoriet, II, (1886) 152–167; III, (1891) 53–78.

[4] Zeitschr. f. d. gesammte Brauwesen, no. 30–32, 1892.

[5] Reprint from the American Chemical Journal, XV, no. 1. (1893.)

[6] Die landwirtschaftlichen Versuchsstationen, XXXIX, 401 (1891), esp. pp. 425—430.

All the natural pentoses so far known belong to the *l*-series, and all the natural hexoses to the *d*-series. Plants by assimilation either form hexoses and pentoses, or have the power to change *d*- into *l*-compounds. The theory of Baeyer, does not make it improbable that both pentoses and hexoses are formed. This work was undertaken to determine the limits of the reactions. Soluble pentoses which could be identified as wandering substances were sought.

It was possible in all cases which were examined to show the presence of soluble substances which form furfurol; but these substances might be hexoses which furnish traces of furfurol. On this account it was necessary to estimate how much furfurol the hexoses which were present could form and how much in fact was formed.

For the estimation of small amounts of furfurol a method was devised which depended on the color reaction of furfurol and an acetic acid solution of aniline. It was proved that the amount of hexoses present was not sufficient to explain the formation of all the furfurol and therefore soluble pentoses were present. Leaves and colorless bark were used for the experiments. The soluble pentoses are easily diffusible through membranes. The fact leads to the conclusion that the soluble pentoses are simple sugars, $C_5 H_{10} O_5$. The investigation confirmed the belief that the small amount of soluble pentoses is not perceptibly diminished by the death of the leaves. In the leaves of the oak there was found in the evening a small but evident excess in the amount of soluble pentoses over that found in the morning. Joined to this is the hypothesis that the soluble pentoses are temporarily converted into stable forms directly after their formation by the process of assimilation.

This paper forms a very important appendix to the long and fundamental paper by Tollens and his students from 1891 cited above. De Chalmot promises a further discussion of his hypothesis.—J. CHRISTIAN BAY.

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[7] Biologisches Centralblatt, XXII, September, (1892.)